Chair for Computation in Engineering
Deparment of Civil, Geo and Environmental Engineering
Technical University of Munich

Application for Electric Vehicle Race Optimization

Project Characteristics

Modeling:	★★★★★
Mathematics:	★★★☆☆
Programming:	★★★☆☆
Science:	★★★★☆

Setting:
The use of autonomous vehicles is increasing, and driverless races are starting to take form. This project is aimed at driverless races where a virtual driver could be trained on a virtual racetrack.

Your Goal:
Combine an existing car model with a racetrack model, programmatically determine the optimal path for the vehicle and tune the suspension/tires of the car for the best possible lap-time.

Your Tasks:

- Familiarize yourself with model based design (focus on Simscape Multibody, Vehicle Dynamics Blockset, Automated Driving System Toolbox, Mapping toolbox, optimization toolbox)
- Use circuit geometry to determine optimal racing line for point mass model
- Integrate existing high fidelity vehicle model into race-simulator
- Tune the suspension hardpoints for better lap times
- Optimize lap for power consumption
- Include support for gaming input devices (Gamepad/Steering wheel)